

### ABSTRACT

The invention provides copper-based preferential oxidation catalysts containing low concentrations of platinum group metals. In some embodiments, the catalysts of the invention have an oxide support on which is dispersed copper or an oxide thereof, a platinum group metal and a reducible metal oxide. In other embodiments, the catalysts have a cerium oxide support on which is dispersed copper or an oxide thereof and a platinum group metal. The catalysts serve as effective preferential oxidation catalyst that selectively oxidize carbon monoxide with minimal consumption of hydrogen. In some embodiments the catalysts of the invention are able to achieve levels of carbon monoxide below 10 ppm in output gas streams containing hydrogen operating with wide temperature ranges. The invention also provides apparatus, such as fuel processors, that supply hydrogen to a fuel cell, that incorporate the preferential oxidation catalysts.